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Tetsuro Takizawa

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EXAMINER

PEIKARI, BEHZAD

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/811,290

**Applicant(s)**

TAKIZAWA, TETSURO

**Examiner**

B. James Peikari

**Art Unit**

2189

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 April 2008.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2,5,7,10,12,15,17 and 20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2,5,12 and 15 is/are rejected.  
7) ☒ Claim(s) 7,10,17 and 20 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 24 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The previous objection to the specification is withdrawn due to the amendment filed April 9, 2008. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

2. Claims 2, 5, 7, 10, 12, 15, 17 and 20 are objected to because each occurrence of "the hit" and "the miss" should be changed back to "a hit" and "a miss", respectively.

3. Claims 2, 5, 7, 10, 12, 15, 17 and 20 are objected to because of minor errors in punctuation. In claim 2, for example:

- (A) in line 9, a semicolon should replace ", and"
- (B) in line 14, "; and" should be inserted after "routine"
- (C) in line 17, the second comma should be deleted
- (D) in line 19, a comma should be inserted immediately after the parenthesis.

Similar changes to the other independent claims are required.

4. Claims 17 and 20 are objected to because two different outcomes are listed for memory masters accessing a same bank and a same page, which is confusing.

Language equivalent to claims 7 and 10 is suggested to overcome this objection.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 5, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumann et al., U.S. 5,889,714.

(A) As for claim 2, Schumann et al. teach the claimed invention including a memory access control device (*see Figure 1*) comprising:

a memory master to request access to memory (*note CPU 12*);

a memory control unit (*note memory controller 20*) to produce control signals of memories based on access information to be output from said memory master (*note Figure 2, "From Proc. 12"*);

a hit predicting unit (*note control logic element 24*) to predict whether or not a next access to each bank in memory will be directed to a same row (*note the row match prediction of Figure 2*);

wherein, for each of a last natural number of times (*Schumann et al. chose the natural number 4, but notes that the choice of four bits is arbitrary and may be changed as desired, see column 7, lines 27-30*) of accesses to each bank in memory, said hit

predicting unit stores whether a hit or a miss has been found as history information (*note history register 246 and column 7, lines 24 et seq.*), and

wherein, when said hit predicting unit predicts a hit based on the history information, said memory control unit terminates a routine without closing a bank at a time of completion of present access operations (*note column 7, lines 35-38*) and, when said hit predicting unit predicts a miss based on the history information, said memory unit closes said bank at the time of completion of present access operation and terminates the routine (*note column 7, lines 53-56*); and

wherein, for each of a last "n" times of accesses to each bank in memory, said hit predicting unit stores whether a hit or a miss has been found (*note column 7, lines 35 et seq.*), and said hit predicting unit predicts a hit if, out of the last "n" times of accesses, a number of times of accesses in which a hit has been found is "m" or more (m is less than or equal to n), "m" being a result of adding said number of times of accesses in which the hit has been found; and said hit predicting unit predicts a miss, if said number of times of accesses is not "m" or more (*this is explicitly shown by one of the examples given in Schumann et al. in which  $n=4$  and  $m=3$ ; note column 7, lines 40-49*).

Schumann et al. did not explicitly mention access to a same page, but instead was concerned with access to a same row. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included pages as the "given group of memory locations" (see column 1, lines 32-33) in the system of Schumann et al., because pages may contain one or more rows, such that access to a given row would mean access to a given page.

(B) As for claim 5, this is rejected for reasons similar to those outlined for claim 2 above.

(C) As for claims 12 and 15, these are rejected for reasons similar to those outlined for claim 2 above. Furthermore, column 8, lines 7-19 of Schumann et al. describe how the "precharge policy logic circuit" can arbitrate between two memory masters, the CPU and the DMA, as required of claims 12 and 15.

***Allowable Subject Matter***

7. Claims 7 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and corrected to overcome the objections above.

Schumann et al. do teach operation regardless of prediction logic, as required of claims 7 and 10 (see column 8, lines 1-4, which describes how the predictor can be disabled), but not with the same open/close policy set forth in claims 7 and 10.

8. Claims 17 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and corrected to overcome the objections above by being amended to correspond to claims 7 and 10.

***Response to Amendment***

9. Applicant's arguments with respect to the claims have been considered but are not deemed convincing, except with regards to claims 7 and 10 (and possibly claims 17 and 20).

While the grounds of rejection have not changed for claims 2, 5, 12 and 15, the text of the rejection has been rewritten to specifically address each of the arguments raised in pages 11-13 of the response filed with the amendment of April 9, 2008.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Peikari whose telephone number is (571) 272-

4185. The examiner is generally available between 7:00 am and 7:30 pm, EST, Monday through Wednesday, and between 5:30 am and 4:00 pm on Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached at (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free).

/B. James Peikari/  
Primary Examiner, Art Unit 2189  
10/6/2008